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ABSTRACT

Computer drawing programs have several characteristics that make them appropriate for use in early childhood education. Drawing at the computer is an activity that captures and holds children's attention. Children at all developmental levels of graphic ability can draw at the computer, and their products can be stored in a disc or printed for display. Preliminary studies indicate that computer drawing activites are appropriate for children as young as 3 years of age. Given a chance, children will choose to work at the computer as readily as they choose sand, water, and block activity. (RH)

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Children's Computer Drawings

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Children's Computer Drawings

In the field of interactive computer activity for young children, there is an emergence of programs that are compelling in their capacity to developmentally coordinate the abilities and interests of young children in the same ways that sand, water, blocks, and art activities do. These interactive computer programs, as opposed to the skill and drill of computer-assisted instruction (CAI), are primarily graphic in nature. Known as drawing programs, they are basically symbolic extensions of traditional art experiences affording similar (not exact) kinds of experience and control over tool and medium as the kinds of experience and control available for children in their paper and pencil, brush and paint activity. Fingers push keys on a keyboard to direct a spot to apply light on a T.V. screen instead of using the hand to hold a brush to apply paint on paper.

In these graphic or drawing programs, children direct a cursor around a T.V. screen using simple language keyboard commands to draw long or short lines, curves, turns, and shapes with various attendant line-color and color fill-in capacities. The drawing appears and is constructed on a television display screen as the child draws it. Computer drawing is very similar to the popular, but simpler, Etch-a-Sketch board and is analogous to other experiential interactive activity traditionally considered to be part of a high-quality developmental early childhood school program.

As in all good early childhood curriculum activity, these programs provide increasingly sophisticated levels of operation and interaction by the child. Once the language and procedures are understood, they are provocative enough to capture children's attention without an adult being present. They invite experimentation and planning. The drawn images can be transformed by the child's action. Finally, each function and drawing has attributes which can be talked about and understood; attributes of line and its length and color; turn and its amount and direction; and shape and its label, color and qualities.

While this kind of computer activity satisfies the activity qualities most desired in well-conceived early childhood curriculum activity, those who want computer activity for its own sake will find that the drawing programs, like most computer programs, are infinitely patient. They wait until a child is ready to act and only then provide an immediate response which can be erased or altered if so desired. Initiating, manipulating without criticism, and terminating the program are also all within the child's control.

Good computer drawing programs, like good teachers and good curriculum materials, validate the instincts of young children who, when drawing, are instinctive rather than reflective in their activities. Scribbles on paper composed of dots, lines, curves and marks find analogs on the computer screen. These points of similarity appear as dashes, spaces, turns, and lines...recapitulations of instinctive key presses from inquisitive fingers. The color choices of the paint

box are also found in computer drawing programs. Initially, they are the most exploited function, followed by drawing lines while the cursor bounces and ricochets like a billiard ball, or wraps around the screen appearing in difficult-to-predict places opposite where it disappeared.

In time, just as dots, lines, curves and marks are controlled and combined by the young artist, dashes, spaces, turns, and long lines become controlled and combined and take on representational or symbolic meaning for the young computer programmer. Children's artistic compositions are labelled, implying what the collection of marks represents to the child. The meaning (if there is to be any) in both drawing modes is often made up as the child constructs the composition. Each step in the procedure often inspires or instructs the next; it is less instinctual now than when crayon first touched paper or finger first touched keys.

At about the same time that children consistently draw on paper so as to represent real things in the world, computer drawing also accommodates the desire to draw real things. Another interesting thing happens also. The blinking cursor itself which draws lines and turns on the screen begins to have symbolic meaning for some children. For one child it is a plane or space ship flying through the air, crashing into the colored frame on the screen or into the lines drawn earlier in the program. For another child, the cursor is himself, showing others how he jumps on his bed and how high he can jump.

As in all artistic endeavors, the products created can be saved; computer drawings are no exception. Drawings done on the

computer can be saved temporarily until the computer is shut off at which time all memory of all programs is lost. Each picture drawn is a program, so before the computer is turned off, each picture program can be transferred out of the memory of the computer and preserved on a saving disk. If there is a printer attached to the computer, a picture displayed on the screen can be printed out through the printer onto a piece of paper and saved, even hung up if desired. If a clear piece of acetate is secured to the monitor screen, magic markers which draw on plastic can be used to trace and color in each picture appearing on the screen.

Each picture saved represents a remarkable history of a child's developmental growth and skill whether it's in computer drawings, or the plain old-fashioned kind. Comparing a child's early drawings with more recent ones will reveal increasing control over the potentials of the program, paralleling the control that occurs with favorite traditional art tools and mediums. When studying a sequence of computer scribblings or drawings for a particular child, look for:

- The use and eventual exploitation of what is known of the program. (draw, turn, move, color, fill)
- The drawings as examples of the general learning, work habits or styles. Some children are adventuresome, taking whatever comes and running with it. Others have more control over their efforts, deliberating each decision.
- The computer drawings compared to the off-computer drawings. How does one appear to influence the other or coordinate with the other?
- The controlling of what they are doing vs the abandoning of themselves to what can be done. Basically, work vs play.
- The development of themes consistent with the traditional art themes of houses, people, transportation, flowers, etc.

- The repetition of operations or strategies from one drawing to another. Is there a consistent pattern to their drawings time after time? Are they exploiting one command or afraid to try others?
- The change of "style" from one drawing to another, implying intentionality or increasing control or increasing awareness of what is possible in the program.
- The movement from "scribbling" to representation.

Preliminary studies confirm the developmental appropriateness of computer drawing activity for children as young as three years. When the computer is one of many choice activities available during the school day, as many children choose to work on the computer as choose to work with blocks. Computer drawing activity also contains geometric and mathematical dimensions which are difficult to perceive in traditional art experiences but are apparent to adult computer artists and viewers. The structure of a line and a turn as an infinite and continuous set of points along a continuum is more readily apparent in drawing on the computer screen than in drawing on paper with a pencil. The prevailing temptation for teachers is to exploit this potential for treating traditional math and geometry skills and concepts. Some proponents of computer drawing feel that, in time, children will understand the structures of lines and turns because of their experiences with computer drawing. However, children's perception of what is apparent to adults in this regard is questionable.

To date, there is little or no empirical evidence to use in advocating or arguing against computer drawing programs for young children, or for substantiating any claims made for the artistic, mathematical and geometric learnings of children's use

of this activity by graphic program developers.

All that is known is that given a chance, children as young as three will choose to work at the computer as readily as they choose sand, water and block activity. Some children, after their turn at the computer, go to the art area and draw things reminiscent of what they just constructed on the computer screen. There is indeed an irrefutable attraction to this program activity by young children.

Interactive computer activity of the sort described validates the instincts of young children while at the same time it recognizes and reflects the shape and nature of our technological culture. Given that, we need to measure and articulate the impact of this program on the ways it potentially influences children's ways of doing and reasoning.